BC Hydro Integrated Resource Plan

Technical Advisory Committee Meeting #9 Summary Notes April 8, 2021

Meeting	Technical Advisory Committee – Meeting #9 • Domestic Non-firm and Market Allowance • Options to Meet Future Needs (LM/VI) • Environmental Attributes
Date	April 8, 2021 – 9:00 a.m. to 3:00 p.m.
Location	Webex Virtual Meeting
Committee attendees (participants and alternates)	BC Hydro – Committee Moderator & Presenter – Basil Stumborg BC Hydro – Market Allowance Presenter – Sanjaya De Zoysa BC Hydro – Options to Meet Future Needs Presenter – Alex Tu Association of Major Power Consumers (AMPC) – Melissa Davies BC First Nations Energy & Mining Council (BCFNEMC) – Cam Osler BC Public Interest Advisory Council (BCPIAC) – Leigha Worth BC Public Interest Advisory Council (BCPIAC) – Irina Mis (alternate) BC Sustainable Energy Association (BCSEA) – Thomas Hackney BC Sustainable Energy Association (BCSEA) – Bill Andrews (alternate) BC Utilities Commission (BCUC) – Nicola Simon* Canadian Association of Petroleum Producers (CAPP) – Geoff Morrison Clean Energy Association of BC (CEABC) – Peter Zell Climate Action Secretariat – Chris Gilmore Commercial Energy Consumers (CEC) – David Craig City of Vancouver – Matt Horne FortisBC (Electric) – Mike Hopkins FortisBC (Gas) – Ken Ross Ministry of Energy, Mines & Petroleum Resources (MEMPR) – Jack Buchanan* Ministry of Energy, Mines & Petroleum Resources (MEMPR) – Paul Wieringa (alternate) Movement of United Professionals (MoveUP) – Jim Quail Pembina Institute – Tom Pierre Frappé-Sénéclauze University of Victoria (academic representation) – Andrew Rowe * *MEMPR and BCUC members attend as observers*
BC Hydro attendees	Tony Chu, Bill Clendinning, Dale Flood, Anthea Jubb, Ryan Rasmussen, Doug Robinson, Eddie Young, Anne Wilson
Meeting materials	• Presentation slides • Pre-Meeting Reading – Generation Energy Planning Criterion: Domestic Non-Firm and Market Allowance • Pre-Meeting Reading – Demand-Side Management (DSM) & Rate Options • Pre-Meeting Reading – Environmental Attributes

Welcome and Agenda Overview
Presented by Basil Stumborg (slides 1-6)

Basil welcomed participants and outlined the meeting objectives and agenda for the day. BC Hydro adjusted the format for this Technical Advisory Committee (TAC) meeting from the previous eight meetings. BC Hydro sent pre-read materials several days in advance on each subject covered in the meeting for review by TAC participants. BC Hydro began each presentation section with a brief overview to frame the topic, which was followed by a roundtable with TAC participants who provided the areas of interests and questions that arose during their pre-read. The results of the roundtable formed the basis of the discussion.

Domestic Non-Firm and Market Allowance
Presented by Sanjaya De Zoysa (slides 7-18)

Summary of Roundtable

BC Hydro provided a brief overview of this section, which was followed by a roundtable with TAC members who provided comments based on their pre-read of the slides and the market allowance briefing note, which included:

- Confusion about definitions in the paper, including why domestic non-firm and market allowance are grouped together. There was also confusion about the definition of average water.
- Interest in priorities regarding how to view the analysis, for example is it reliability or costs driving? Also mentioned Indigenous interests could be looked at separately, for example if electricity purchase agreements (EPAs) and involvement are important, these could be looked at separately
- Interest in the assumptions around 100% clean electricity standard and how will BC Hydro approach emissions accounting if a standard is in place. Clarifying assumptions for market conditions and costs with the clean electricity standard was also mentioned.
- Linkages to the electrification strategy were noted, and the timing of the B.C. Government review will drive further work.
- The concept of a regional energy market was raised and would like to see this expanded upon.
- The way it is presented there is a current reliance of 4100 GWh under average water flows; however, there is no line that says allowance for imports on current load resource balances (LRBs) – suggest aligning with the LRBs as with the past.

- Would be helpful to see the material impact on independent power producers (IPPs), and what the constraints are on BC Hydro having more net export stance; also some interest in looking at transmission constraints.
- There was interest in how changing the market allowance will improve BC Hydro's planning for resources over the long term, and how this will interact with demand-side management (DSM) and other investments – the cost-effectiveness and interactions across objectives will be important and this may provide flexibility in the future.
- Questions as to why now, if we have a surplus with Site C coming online, what is the purpose of adding more to the planning surplus at this time?

TAC participants noted that the areas of interests and questions fell into three broad categories: definitions clarification, policy, and impacts. The discussion started with clarifying a policy point, then moved into definitions clarification.

Q&A Notes

Q: It looks as if BC Hydro has come to a conclusion about market allowance, and so has this been decided?

A: BC Hydro clarified that no conclusions have been made. The Government of B.C.'s Phase 1 Comprehensive Review Interim Report instructed BC Hydro to examine removal of the self-sufficiency requirement. We have presented an analysis of those alternatives showing higher and lower levels of allowance, relative to that allowed under self-sufficiency. We are informing outcomes and impacts by varying this level. We are continuing with the Integrated Resource Plan (IRP) with self-sufficiency in place and building out portfolios based on existing policy. BC Hydro is not taking a position on self-sufficiency.

Q: Could you better define the current definition of resource in BC Hydro's Load Resource Balances?

A: BC Hydro's calculation of existing and committed resources is in alignment with the *Clean Energy Act* and the *Electricity Self-Sufficiency Regulation*. Looking at the existing and committed resources in our Load Resource Balances, we count on generation assuming average water from our heritage assets, then add IPP resource capability. For IPP hydroelectric resources, the maximum amount of energy that can be counted on continues to be assessed under critical (dry) water conditions. For other IPP resources, their actual average energy production is relied upon for firm energy contribution unless they have contractual firm energy commitments. Together, they make the energy capability of the system. If the forecast load goes above this capability, then we add new resources.

Q: How does the Clean Energy Standard fit into an increased market allowance? Will you be importing more 'dirty' energy?

A: The B.C. Government has an interest in a 100% clean energy delivery standard and is looking at this closely. The Comprehensive Review Phase 2 Interim Report contemplated a clean energy standard, but this has not yet been defined. The market allowance portfolio options merely track the amount of annual imported energy. How this is translated into non-clean amounts and how this impacts the Clean Standard are details that will be determined in the future.

Q: The value of energy generated or imported is material – what studies have been done on the market forecast – e.g. growth of renewables? Know this may be a difficult question.

A: In an earlier TAC meeting, we showed our mid-market price forecast. As part of the market price forecast work, this variable is considered.

Q: In BC Hydro's definition of 'economic benefits' on slide 17, did the analysis consider all social-economic benefits, like BCIOM (British Columbia Input-Output Model), which calculates direct, indirect, and induced economic impacts or projects or initiatives? There was a comment that we should be looking at the multiplier effect as well. There was also a comment that the analysis should be considering demand-side as well as supply side resources as there are multiplier effects there as well, and do did the analysis capture all economic activities, or just the ones arising from the IPP sector?

A: Our analysis of economic development is narrow and focuses only on direct jobs arising from greenfield projects. We will take this feedback away (regarding including indirect and induced effects and including activities outside of greenfield projects – such as DSM spending) for consideration.

Q: Some concern raised about economic development as jobs as BC Hydro funding the domestic IPP industry.

A: Thanks for the comment for consideration.

Q: Can BC Hydro ensure that First Nations' interests are represented more broadly than just being directly linked to EPA renewals or self-sufficiency? It seems like Indigenous Nations issues is a category under themselves and this presentation may be locking it into specific issues. May think about the category as 'rate payer costs'. Important to consider Indigenous Nations interests, may want to consider the context. It is important that benefits for Indigenous People is not assumed to be an EPA question. Particularly if it is an added cost to ratepayers and there are alternative more attractive ways to engage and benefit Indigenous communities.

A: Upon discussion with TAC, we understand that EPA renewals are one of several ways that IRP actions can impact Indigenous Peoples' interests. BC Hydro will endeavor to find the right balance between the broader context and this specific link and will take it away for consideration.

Q: It would be useful to understand the Indigenous interests as a factor in considering EPA renewals, and a question as to whether there was an Indigenous-led dimension to the resource options. There was a comment that Indigenous are involved with many IPPs.

A: Thanks for the comment for consideration.

Q: A point for clarification – economic benefits label should really be economic costs. The positive $600 is a cost not a benefit.

A: Thanks for the comment for consideration.

Q: How are the costs and risks of transmission constraints for imports and exports factored into the portfolio options and analysis?

A: BC Hydro reflected transmission costs and system reliability risks in two ways. For transmission within the province, transmission is reflected within portfolios as new resources are picked. If we are thinking of transmission outside of the province, it connects to the reliability discussion and transmission constraints. The table shown to TAC also reflected some proxy measures for how the different planning positions would approach transmission constraints, but these were not monetized. It was highlighted that the transmission capability is shown as about 2,500 MW in slide 13, not to be confused with the GWh numbers of market allowance. The 2,500 MW of capacity would translate to much more GWh per year.

Options to Meet Future Demand Needs
Presented by Alex Tu & Basil Stumborg (slides 19-53)

Summary of Roundtable

Bill started this section by noting that in December that some TAC members provided feedback about exploring additional demand-side measure options that achieve further savings, and that BC Hydro planning staff have come up with additional options. Basil then led a roundtable to provide an opportunity for TAC participants to raise their areas of interest or questions based on their review of the pre-read materials about meeting future demand needs, which included:

- Interest in timelines and direction around time of use rates. What the timeline may be and the tradeoffs with a regional capacity shortfall in the Lower Mainland by 2027. How do we reconcile having an energy surplus and a regional capacity shortfall? Do we incent heat pumps?

- There were some challenges understanding the analysis in the DSM options and determine whether they represent cost-effective or not cost-effective options.
- Curious to understand if we see reductions through DSM how fixed overhead costs get built into the mix and how does having less revenue fit in this picture?
- Curious about – after the DSM options – how supply fits into the picture. With wind and solar and renewables costs falling, when will your long run marginal cost come into play/ How do they cross or not?
- Interest in discussing the structure of rates to offer more diverse options to keep system costs down.
- Interested in demand-side drivers, electrification and fuel switching in the Lower Mainland.
- Interest in knowing how BC Hydro came to use Total Resource Cost and Utility Cost as evaluation criteria versus other tests such as the RIM test that take into consideration rate impacts?
- Interest in how BC Hydro puts it all together – it is a regional analysis, and curious to know how BC Hydro came to some conclusions. Interested in the big picture. Also curious about the Effective Load Carrying Capacity (ELCC) analysis.
- Curious in learning about how capacity that comes with time varying rates is determined.
- Multiple TAC participants wanted more details about the specifics about the designing of rates and how that would provide BC Hydro with system capacity relief. There was additional dialogue about the role DSM will play as a tool to generate this capacity relief, including noted concerns about potential subsidization or free ridership and potential impacts on future rate increases. TAC members also called on BC Hydro to better reflect 'affordability' when comparing options. The present value and the rate impact numbers do not do a good job at illuminating this concept. Finally, TAC participants wanted more detail about how new programs could align with provincial policy objectives, such as CleanBC.

Q&A Notes

Q: Why are you valuing capacity savings more than energy savings?

A: Prioritization of energy or capacity is context dependent, and in general the portfolio optimizer prioritizes capacity or energy based on the priority needs of the system. For example, when we consider energy efficiency programs that provide both energy and capacity, capacity is prioritized because that is the more immediate need for the Lower Mainland/Vancouver Island region (by 2027). Energy savings are considered a supplemental benefit to capacity savings in this context and valued at the market rate during energy surplus periods.

Q: How does BC Hydro's portfolio value surplus energy?

A: During the energy surplus periods, the portfolio values surplus energy at the time that it is generated using the forecast Mid-C market price.

Q: Why does BC Hydro only use Total Resource Cost and Utility Cost in conducting its benefits analysis, and not other types of rate impact metrics? It is important to look at others and not be bound by commission requirements.

A: Total Resource Cost and Utility Costs are prescribed forms of analysis from the BC Utilities Commission's (BCUC's) Resource Planning Guidelines. Thanks for the input, and we can consider additional measurement tools and decipher how they can best inform our portfolio.

Q: How certain is the amount of capacity listed for these options (slide 25)?

A: Good question. There is uncertainty with participation and response levels for rate options – how many sign up and how far they will go with respect to shifting load. We have looked at other jurisdictions. As we gain experience and evaluate, we will become more confident in our forecasts. For uncertainty around energy efficiency or demand response options, we use a process of subjective discussions similar to the method we used in 2013 and come up with ranges around our programs.

Q: Why is BC Hydro considering new rates in the short-term when the capacity shortfall is not until 2027? If we go to Suite 3, how early would we need to start?

A: All of BC Hydro's rate designs are subject to consultation, regulatory hearing processes and determination by the BCUC. As such, the process of introducing new rates to our customers can take up to two years. Additionally, voluntary (opt-in) rate designs have a sign-up period while they are socialized with our customers, so there can be a lag in BC Hydro achieving the full benefits of new rates. Further, for resources such as rates that gradually increase savings over time, there may be value in starting these programs early to achieve higher savings in later years when they are needed.

Q: In modelling do we carry the cost in the lead time?

A: Yes, if there are positive costs we will carry them.

Q: Comment that BC Hydro could get the rate design done early and undertake some pilots before they are needed.

A: Thanks for this suggestion, we'll take it away for consideration.

Q: Do optional Time-of-Use Rates have a high volume of free ridership?

A: BC Hydro also recognizes this concern and will examine mitigation strategies in our implementation process. However, we would like to note that as long as rate payers have benefits, collectively, they will be better off.

Q: Would reducing the capacity gap through a hybrid of rate designs or demand-side management likely reduce BC Hydro's needs for new capital

A: Confirmed. This reduction in capital spend/need shows up in our modelling in two ways. At the bulk system, any delay in transmission needs is reflected in reduced portfolio costs. Below the bulk system, we make an assumption that each MW saved leads to a certain reduction in transmission and distribution capital expenditures.

Q: Are we capturing the value of capacity savings in 'energy-focused demand measures'? It seems like if we are not counting it, then we are missing the value.

A: The capacity savings are recognized and taken into account.

Q: Does BC Hydro have an updated Long-Run Marginal Cost?

A: BC Hydro does not currently have an updated Long-Run Marginal Cost. BC Hydro will be producing a new Long-Run Marginal Cost (reference price for energy) once we have completed its Base Resource Plan as part of this IRP.

Q: Where can TAC members find out more about these specific packages of rate options, and also about BC Hydro's more detailed rate design processes?

A: BC Hydro provided several details on the rates that make up the Rate Suites during TAC meeting #3. BC Hydro also invites those interested in detailed rate design discussions to join BC Hydro's Rate Design workshops beginning this summer. More information will be available in the DRAFT 2021 IRP we are developing for consultation purposes. Ultimately, details of any rate design proposal don't get fully developed until BC Hydro applies to the BCUC for their approval.

Q: Comment that when thinking about rate impacts, should also be thinking about bill impacts. That is, how is the bill impacts distributed across different customer classes. Energy intensity may also be useful as a measure for demand-side savings as it is an indicator on where more savings could be achieved.

A: Thanks for this comment.

Environmental Attributes (pre-read document)

Given time constraints and the fact that this pre-read document was distributed close to the meeting time, the environmental attributes paper was not a topic for discussion at this meeting; however, participants were invited to follow up with comments or questions after the meeting.

Closing & Final Roundtable

BC Hydro thanked people for participating, and concluded the meeting with a roundtable of final thoughts and comments on the meeting, which included the following:

- Really interesting conversation about specifics of demand-side measures and rates, still wondering how this is integrated with the bigger picture.
- Having a bit of trouble understanding what are the really big level things that need to be resolved.
- Having a framework over different timeframes would be helpful with respect to requirements and costs, understand time horizons and where different pieces fit.
- Really good conversation, looking at future demand – if we are going to reach out greenhouse gas reduction goals, it will look very different out 20 years and a fundamental shift out 30 years.
- Today was focused on more detail level items, at some point the picture will come together.
- This process is very valuable, appreciate the content is thought provoking and useful. It is important that strategy is resilient and able to respond with flexibility, and we shouldn't kid ourselves we know what will be 10 to 15 years out.
- Changes are coming on the gas side as well to meet CleanBC and use renewable gas
- A lot of information here, and as a regulatory participant, very valuable. A big lesson to look at flexibility, we saw impacts of mandatory self-sufficiency and mandated IPP purchases. Take flexibility to degree it can. This will be important to achieve affordability.

- Appreciate these sessions, thought provoking and informative. Appreciate the open dialogue. Encourage BC Hydro to stay focused on principle including economic development and environment.
- Found it informative and stimulating. Gather the plan will be focused on addressing capacity concerns of Lower Mainland and Vancouver Island, and issues such as electric vehicle uptake and demand-side measures. Looking forward to seeing the draft plan and portfolio analysis.
- Need to keep uncertainty at the forefront. Also, really liked the format today.
- Resilience and flexibility for response will be critical along with lean planning for cost-effectiveness.
- Prices/rates and demand-side measures matter, as well as flexibility seem to be the main themes. New generation seems to be available irrespective of how it is built or acquired. Capacity – especially in the Lower Mainland – needs consideration. Regarding transmission, would like to hear more about, particularly in the high scenario.
- Agree, this was a good way to run a TAC meeting (pre-reading material, and open discussion based on interests).

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